

IN THE SPECIFICATION

Please amend the paragraphs of the specification as follows:

On page 1, please replace paragraph [1003] with the following amended paragraph:

[1003] One proposed approach to mitigating self-interference induced by multipath signals and frequency selective channels is space-time (S-T) equalization. S-T equalization can be used in a CDMA system, but requires complex signal processing methods and receiver hardware. Also, S-T equalization requires that each subscriber station include multiple receive antennas. The market for subscriber stations is very price-competitive, leading to a large desire of manufacturers to minimize the hardware cost of subscriber stations. The inclusion of additional antennas to the design of a subscriber station can substantially increase the cost of making the subscriber station. There is therefore a need in the art for ways to combat multipath interference without requiring subscriber stations to have multiple receive antennas.

On page 3, please replace paragraph [1011] with the following amended paragraph:

FIGS. [5a] 5A and [5b] 5B show alternative base station apparatuses for transmitting a data pilot in addition to the pilot burst signals shown in FIG. 3;

On page 3, please replace paragraph [1013] with the following amended paragraph:

FIGS. [7a] 7A and [7b] 7B show alternative apparatuses for receiving data pilot and data signals generated using the apparatuses shown in FIGS. [5a] 5A and [5b] 5B;

On page 4, please replace paragraph [1018] with the following amended paragraph:

FIG. 1 depicts an exemplary wireless communication system in which a base station 102 having a plurality of transmit antennas [104a] 104A-[104m] 104M sends signals to a subscriber station 120 having a single receive antenna 112 through at least two signal paths 106 and 108. Base station 102 transmits signals through the antennas [104] 104A-104M such that one transmit beam 130 is created for transmitting signals along signal path 106. At the same time, base station 102 transmits signals through the antennas [104] 104A-104M such that one transmit beam

132 is created for transmitting signals along signal path 108. Though described in terms of two signal paths (106 and 108), the techniques described below can be easily extended to a greater number of signal paths.

On page 4, please replace paragraph [1019] with the following amended paragraph:

The formation of transmit beams by adapting signals transmitted through multiple antennas is called beam forming, and is well known in the art. Antenna beam patterns are typically shown as radiating from a central point of transmission, with the distance of the curve from the central point indicating the relative strength of a signal transmitted through the antenna. For ease of explanation, the base station 102 and associated antennas [104] 104A-104M are drawn to the left of the antenna beam patterns 130 and 132. In actuality, the antennas [104] 104A-104M would be placed in the center 140 of the antenna beam patterns 130 and 132, and the antenna beam patterns 130 and 132 would radiate directly outward from that center 140.

On page 5, please replace paragraph [1021] with the following amended paragraph:

Between the lobes of an antenna beam pattern there exists a null, in which the signals transmitted through antennas 104 destructively interfere with each other. For example, in the antenna pattern 130, nulls exist between lobes 130A and 130B, between lobes 130B and 130C, and between 130C and 130A. In an exemplary embodiment, antenna beam pattern 130 is formed such that its primary lobe [130a] 130A is placed within or nearly within the null between lobes [132a] 132A and 132B of antenna beam pattern 132. Similarly, antenna beam pattern 132 is formed such that its primary lobe 132A is placed within or nearly within the null between lobes 130A and 130B of antenna beam pattern 130. Such careful arrangement of antenna beam patterns 130 and 132 reduces the degree to which the signals transmitted through each of the antenna beam patterns will destructively interfere with each other when received at subscriber station antenna 112.

On page 10, please replace paragraph [1033] with the following amended paragraph:

In an exemplary embodiment, the data portions 202 sent through the various transmit beams and transmit paths are designed to arrive at the antenna 112 of the subscriber station 120

aligned in time with the pilot bursts 206. In an alternate embodiment, a separate data pilot may be transmitted within the data portions 202 of each frame. For example, as shown in FIG. [5a] 5A, a data pilot might be multiplexed in with the data in a multiplexer 502 prior to being PN-spread in PN spreader 402. The data pilot would be transmitted using the same delays and transmit beams as the data.

On page 10, please replace paragraph [1034] with the following amended paragraph:

Alternatively, as shown in FIG. [5b] 5B, a continuous data pilot might be transmitted for the duration of each data portion 202 of each frame. The transmission of such a continuous data pilot would enable the subscriber station 120 to perform coherent demodulation on the data portions 202 of each frame. In order to allow the subscriber station 120 to distinguish the data pilot from the data, the data pilot and the data are covered using distinguishable codes. In the embodiment shown, the data pilot is covered using a pilot Walsh code W_P in a mixer 504. The data is covered using a data Walsh code W_D in a mixer 506. The Walsh-covered data pilot and Walsh-covered data are then gain-adjusted in gain blocks 508 (G_P) and 510 (G_D) before being summed in a summer 512. The resulting summed signal is then PN-spread in PN spreader 402. As with the embodiment shown in FIG. [5a] 5A, both the data pilot and the data are transmitted using identical delays and through identical transmit beams.

On page 14, please replace paragraph [1043] with the following amended paragraph:

As discussed above, the base station 102 transmits the data portions 202 of the transmit frames through the different transmit beams and transmit paths at different delays. The delays are arranged such that the data portions 202 transmitted through the different transmit beams and transmit paths arrive at receive antenna 112 at the same time. In an exemplary embodiment, the data portions 202 are timed such that they arrive at transmit antenna 112 in synchronism with the pilot signals received through the first transmit path. For example, where τ_1 is set to zero, and is associated with path 106, the data portion [202b] 202B of a data frame sent through that path would arrive at antenna 112 immediately after MAC portion [204b] 204B, which would arrive at antenna 112 immediately after pilot burst portion [206a] 206A. Where data transmitted through beam 132 and transmit path 108 are adjusted to compensate for the difference in path length

between transmit paths 106 and 108, the data portions transmitted through transmit path 108 arrive at antenna 112 at the same time as the data portions transmitted through transmit path 106.

On page 15, please replace paragraph [1045] with the following amended paragraph:

Where separate data pilots are transmitted during data portions 202 of frames as shown in FIGS. [5a] 5A and [5b] 5B, the subscriber station 120 must include additional elements to take advantage of those data pilots. Exemplary embodiments of these additional elements are shown in FIGS. [7a] 7A and [7b] 7B. For example, where a data pilot is multiplexed in with the data as shown in FIG. [5a] 5A, the output of PN despreaders 604A would be provided to a data pilot channel estimator 704, which generates a data weight and phase to be applied to the data in a dot product unit 702. The output of the dot product unit 702 is then provided to demodulator 608. Where a continuous data pilot is generated as shown in FIG. [5b] 5B, the output of PN despreaders 604 would be provided to a pilot Walsh de-cover mixer 732 and to a data Walsh de-cover mixer 734. The output of the pilot Walsh de-cover mixer 732 would then be provided to a pilot filter 736, which would generate a data weight and phase to be applied to the data in a dot product unit 738. The output of the dot product unit 738 is then provided to demodulator 608. The operation of pilot estimators and dot product units to accomplish coherent demodulation is well known in the art. Data pilot estimator 704 and pilot filter 736 may be implemented in any of a variety of ways including FIR filters and accumulators. One of skill in the art will recognize that, where pilot Walsh code W_p is the all-ones Walsh code, mixer 504 and Walsh de-cover mixer 732 may be omitted from the base station 102 and subscriber station 120, respectively.

On page 16, please replace paragraph [1048] with the following amended paragraph:

Step 906 may be performed by a pre-correction processor 450 as described above. Also, the pilot signals and data signals may be generated as described above in accordance with FIGS. 1-4, [5a] 5A, and [5b] 5B. Furthermore, one skilled in the art will recognize that the above-described steps may be performed in a different order than depicted in FIG. 9 to achieve the same outcome.